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FLAX,

DIRECTIONS

FOR ITS

CULTIVATION AND MANAGEMENT.

Revised by G. B. O. M. Deschamps, in the office of
the Registrar of the Province of Canada.

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PREFACE.

It is hoped that this little Manual will be found useful to the Canadian farmer.

The aim of the flax-grower should be, to obtain length, strength and fineness of fibre. A good soil and a showery season will produce the first; attention to the directions for steeping and grassing will secure the second; and the third will be obtained by thick sowing.

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FLAX.

DIRECTIONS FOR ITS CULTIVATION AND MANAGEMENT.

Soil and Rotation.

By attention and careful cultivation, good flax may be grown on various soils ; but some are much better adapted for it than others. The best is a sound, dry, deep loam, with a clay subsoil. It is very desirable that the land should be properly drained and subsoiled ; as, when it is saturated with either underground or surface water, good flax cannot be expected.

Without method, there cannot be success—different soils require a difference of rotation. In the best soils of Flanders, flax is grown in the third year of a seven—course rotation, or the fifth year of a ten—course rotation.

It is not considered generally advisable to grow flax more frequently than once in seven years ; not because it exhausts the land more than any other crop, but because *good flax* cannot be had at short intervals, on the same soil. If grown oftener than once in seven years on the same soil, it will be affected by dead stalks some days before it is fit for pulling.

The following rotation, which would bring flax once in ten years, has been proposed :—First year, potatoes ; second, barley laid down with grasses ;

third year, cut for soiling ; fourth year, pasture ; fifth year, flax, or the one-half might be better in flax, the other in oats, so that with the return of the rotation, which would be in five years, the flax could be put on the ground which, in the last rotatory course was under oats, throwing a range of ten years between the flax crops coming into the same ground.

The following rotation has been recommended as being very profitable:—1. Oats after grass and clover ; 2. Flax, and winter vetches ; 3. Potatoes, or turnips well manured ; 4. Wheat, sown in spring, with clover and grass ; 5. Hay and clover ; 6. Grazing ; 7. Oats ; 8. Flax and winter vetches ; 9. Turnips, well manured ; 10. Barley, sown with clover and grass ; 11. Clover and hay ; 12. Grazing ; 13. Oats. The vetches in Nos. 2 and 8, may be sown immediately after the flax is pulled. The ground should have a top dressing of manure, then ploughed and harrowed in.

In Belgium, flax invariably follows a grain crop—generally oats ; and in this country, where oats is such a usual crop, the same system might be profitably pursued ; but it must be understood, that it is only after oats following a green crop or old lea, and never after two or three succeeding crops of oats. It is a very general error among farmers to consider it necessary that flax should follow a potatoe crop. If lea be broken up, and potatoes planted, followed by a grain crop, a very fine crop of flax may be obtained in the ensuing year.

Preparation of the Soil.

One of the points of the greatest importance, in the culture of flax is, by draining, and by careful and repeated cleansing of the land from weeds, to place it in the finest, deepest and cleanest state. This will facilitate the penetration of the roots, which often go to a depth equal to one-half the length of the plant above ground.

Land intended for flax should be ploughed twice ; once in the autumn, and again before sowing in spring. Much will, of course, depend on the nature of the soil, and the knowledge and experience of the farmer. The land should be so drained and sub-soiled, that it can be sown in flats, which will give more even and much better crops. When sown in ridges, the crop grows unevenly, the plants on the tops and in the hollows being of different lengths. The spring ploughing should be done some time before sowing, to allow any seeds of weeds in the soil to vegetate, and the subsequent harrowing will kill them, and save a great deal of after weeding. Following the harrowing, it is necessary to roll, to give an even surface and consolidate the land, breaking up this again with a short-toothed or seed-harrow before sowing, which should be up and down, not across the ridges or anglewise.

Sowing.

The seed best adapted for the generality of soils, and to produce a good quality of fibre, is Riga. Dutch seed is apt to produce a coarse, branchy stem, although it has been used in many districts, for a series of

years, with perfect success. It is considered by some better for heavy soils. In buying seed, select it plump, shining and heavy, and of the best brands, from a respectable merchant. On no account should an inferior quality be sown. Sift it clear of all the seeds of weeds. This is easily done by fanners, and through a perforated zinc sieve, or a wire sieve, twelve bars to the inch. Much trouble will thus be saved in the weeding. Home-saved seed renewed every two years will produce a better fibre than either Dutch or Riga. It is strongly recommended that every farmer should only sow, every alternate year, as much Riga seed as would produce a sufficient quantity for his flax crop of the following season. The produce of seed, when the proper quantity is sown, averages about 12 bushels to the statute acre, so that the seed saved off one statute acre would sow about five. The proper quantity to be sown is two and a half imperial bushels to the statute acre. When the soil is in proper tilth, it is better to sow too thick than too thin; as with thick sowing the stem grows tall and straight, with only a few seed bolls at the top, and the fibre is found greatly superior in fineness and length, to that produced from thin-sown flax, which grows coarse and branches out, producing much seed, but a very inferior quality of fibre. By sowing only two bushels of seed to the acre, the crop, after heavy rains, will be less liable to lodge.

It is of the greatest importance that the seed should be sown very even. After sowing, cover it across with a seed-harrow, as this spreads it more equally. The seed should be covered about an inch deep.

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Lastly, roll it with a light roller. Flax-seed has been successfully sown with a close drill. Flax should be sown as early as possible. The plant is not killed by moderate frosts, although they check it in its growth. The sowing of clover and grass seeds along with flax, is not advised, when it can be conveniently avoided, as these plants always injure the root ends of the flax. A stolen crop of rape or winter vetches, or of turnips of the stone, or Norfolk globe varieties, may be taken after the flax is pulled.

If a long continuance of drought, with a hot sun, should occur, after the plant has reached a height of two or three inches, the heat will parch the earth, and the vegetation will be checked. With this drawback, the farmer will have occasionally to contend. But when ordinary attention is paid to the preparation of the soil, and when the seed is sown at the proper season, a good braird may almost with certainty be calculated upon.

Weeding.

When the flax is three or four inches in height, it should be carefully weeded. If care has been paid to cleaning the seed and the soil, few weeds will appear. Weeds, besides abstracting a portion of the nourishment, are also hurtful, because when allowed to grow, they are pulled along with the flax, interfere with the retting and scutching, and thus reduce the value of the crop. They also prevent the flax from rising up again when beaten down by wind or rain. Weeding is done in Belgium by women and children, who, with coarse cloths round their knees, creep

along on all-fours. This injures the young plants less than walking on them. They also work facing the wind, so that the plants laid flat by their pressure, may be blown up again, or at least be assisted to regain their upright position.

Methods of preparing Flax for Market.

In Belgium there are two methods of preparing flax for market. One is practised in West Flanders and in French Flanders, and is called the Courtrai system, or white steeping and bleaching. This system can be carried on, on a large scale, much better than the Blue system, but it requires more capital on the part of the manufacturer, as the flax is not ready for market before it is two or three years old. It can only be practised where there is the convenience of good running water, as will be described further on.

By the Blue system, which is practised in different parts of Belgium, flax is prepared and brought to market the same year that it is grown. It is this system, or a modification of it, which will be described first.

Pulling.

The time when flax should be pulled is a point of much nicety to determine. The fibre is in the best state before the seed is quite ripe. If pulled too soon, although the fibre is fine, the great waste in scutching and heckling, renders it unprofitable, and if pulled too late, the additional weight does not compensate for the coarseness of the fibre, and the greater exhaustion of the soil. As a general rule, the best time for pulling is, when the seeds begin to change

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from a green to a pale brown colour, and the stalk has turned yellow for about two-thirds of its height from the ground. When pulled too green, flax will be of a dark colour and spotted. At the pulling time, the plant is sometimes affected by a spot, called in Flemish, *honing dauw*, in French, *miellure*. There are black and reddish spots, the latter giving a tint to the fibre, that will never bleach out, but the black are very little injurious. The spots make their appearance first on the top of the plant, and no time should then be lost in pulling. Pulling must be done in dry weather only. When any of the crop is lodged, and suffering from wet, it should be pulled as soon as possible, and kept by itself. When the flax is of different lengths, pull each length separately, and keep them separate in steeping. It is most essential to take time and care to keep the flax even like a brush, at the root ends. This increases the value to the spinner, and of course to the grower, who will be amply repaid by an additional price for any extra trouble. Let the handfuls of pulled flax be laid across each other diagonally, to be ready for the

Rippling.

This should be carried on at the same time, and in the same field, with the pulling. The apparatus is very simple. The ripple consists of a row of iron teeth screwed into a block of wood, and can be made by any handy blacksmith. The best ripples are made of half inch square rods of iron, placed with the angles of iron next the ripplers, $\frac{3}{16}$ ths of an inch asunder at the bottom, half an inch at the top, and 18

inches long, to allow a sufficient spring, and save much breaking of flax. The points should begin to taper 3 inches from the top. This implement is to be taken to the field where the flax is being pulled, and screwed down to the centre of a nine-foot plank, resting on two stools. The riplers may either stand or sit astride at opposite ends. They should be at such a distance from the comb as to permit of their striking it properly and alternately. A winnowing cloth or sheet must be placed under them, to receive the bolls as they are rippled off; and then the riplers are ready to receive the flax just pulled, the handfals having been placed diagonally, and bound up in a sheaf. The sheaf is laid down at the right hand of the rippler, and untied. He takes a handful with one hand, about six inches from the root, and a little nearer the top with the other. He spreads the top of the handful like a fan, draws the one-half of it through the comb, and the other half past the side, and by a half turn of the wrist, the same operation is repeated with the rest of the bunch. Some, however, prefer rippling without turning the hand, giving the flax one or two pulls through, according to the quantity of bolls. The flax can often be rippled without being passed more than once through the comb. He then lays the handfals down at his left side, *each handful* crossing the other, when the sheaf should be carefully tied up and removed. The object of crossing the handfals so carefully, after rippling, when tying up the beets for the steep, is, that they will part freely from each other, when they are taken to spread out on the grass after steeping, and not interlock, and be

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If the weather be dry, the bolls should be kept in the field, spread on winnow cloths, or other contrivance for drying ; and, if turned, from time to time, they will win. Passing the bolls first through a coarse riddle, and afterwards through fanners, to remove straws and leaves, will facilitate the drying. If the weather be moist, they should be taken indoors, and spread out thinly and evenly on a barn floor, or on a loft, leaving windows and doors open, to allow a thorough current of air, and turned twice a day. By the above plan of slow drying, the seed has time to imbibe all the juices that remain in the husk, and to become perfectly ripe. In our climate the bolls should never be dried by artificial heat on a kiln, which shrivels the seed and leaves little nutritious matter. In fine seasons they should always be dried in the open air, the seed thrashed out and the heaviest and plumpest saved for sowing or crushing. The light seeds and chaff form a most wholesome and nutritious feeding for cattle.

Flax, when treated on the system of green steeping, now being described, ought not to be allowed to stand in the field. It should be rippled as soon as pulled, and carried to the water at once.

Watering or Steeping.

This process requires the greatest care and attention. River water is the best. If spring water has to be used, let the pond be filled some weeks before the flax is put in, that the sun and air may soften the

water. That containing iron or other mineral substances should never be used. If river water can be had, it need not be let into the pond till after the flax has been put in. The best size of a steep-pool is 12 to 18 feet broad, and $3\frac{1}{4}$ to 4 feet deep. Place the flax loosely in the pool, in one layer, somewhat sloped, and in regular rows, with the root end underneath; the tie of each row of sheaves to reach the roots of the previous one. Cover with boards, or other material, with stones laid on them, so as to keep the flax two or three inches under the water. In two or three days fermentation commences, and more stone must be laid on, to keep it below the surface. As fermentation ceases, the flax will sink daily, and stone must be taken off in proportion. Thus treated, it never sinks to the bottom. A small stream of water allowed to run through a pool will be found to improve the colour. In this case, if the pools are in a line, the stream should be conducted along the one side, and run into each pool separately, and the water of each pool run off along the opposite side. It will be sufficiently steeped, in an average time, from eight to fourteen days, according to the heat of the weather and the nature of the water. Every grower, who steeps his own flax, should learn to know when it has had enough of the water, as a few hours too much may injure it. The best test is the following:—Try some stalks of average thickness, by breaking the *shove*, or woody part, in two places, about six or eight inches apart, at the middle of the stalk; catch the broken bit of wood, and if it *will pull freely out, downwards, for that length,*

without breaking or tearing the fibre, and with none of the fibre adhering to it, it is ready to take out. Make this trial every six hours, after fermentation subsides, for sometimes the change is rapid. Flax, that is very coarse, or has been lying, will not endure the water so long as a fine good quality. Flax that has been pulled greener than is usually done, will not bear the water so long as that which has arrived at its proper maturity.

Never lift the flax roughly from the pool with forks, as the fibre is very tender when in a wet state. It must therefore be handed out with great care. It is advantageous to let it drain for some hours, after being taken from the pool, by placing the bundles on their root ends, close together; but the heaps should not be too large, otherwise it will be injured by heating.

Spreading or Bleaching.

Select, when possible, clean, short, thick pasture land for this operation, and cut down and remove any large weeds. Spread the flax very evenly on the grass, about half an inch thick. If the directions under the head of Rippling, have been attended to, the handfuls will separate readily, without entangling. Turn it two or three times while on the grass (with a rod about eight feet in length, and an inch and a half in diameter), that it may not become of different shades, by the unequal action of the sun, which is often the case, by inattention to this point. Turn it when there is a prospect of rain, that it may be beaten down a little, and thus prevented from being blown away.

Lifting.

Six to eight days if the weather be showery, or ten to twelve if it be dry, should be sufficient on the grass. A good test of its being ready to lift, is to rub a few stalks from the top to the bottom, and when the wood breaks easily, and separates from the fibre, leaving it sound, it has had enough of the grass; also, when a large proportion of the stalks are perceived to form a *bow and string*, from the fibre contracting and separating from the woody stalk. But the most certain way is, to prove a small quantity with the hand-break, or in a flax mill. In lifting, keep the lengths straight, and the ends even, otherwise great loss will occur in the breaking and scutching. Let it be turned the day that it is to be lifted, as it cannot be too dry before it is tied up in bundles. If not taken soon to be scutched, it will be improved by being put up in small staks.

Drying.

Drying by fire *is always most pernicious*. If properly steeped and grassed, no such drying is necessary. By so drying it, the rich oily appearance of the flax is greatly impaired, and the fibre is either destroyed or rendered not worth one-half of what it would be if properly prepared.

Breaking and Scutching.

The breaking is performed by an instrument called a brake. The object is to give the wood, or boon, or shove, such a degree of brittleness as to make it part readily from the harl, which encloses it like a tube. For this purpose the hand-brake may be used, or the

brake-machine consisting of several deeply fluted rollers. In Belgium, beating by means of the *bott-hammer* is much practised. This is a wooden block fixed to a long bent helve or handle, and has channels or flutings on its under face. By the brake or hammer the whole wood is never separated from the textile fibres, but a certain quantity of chaffy stuff adheres to them, which is removed by scraping the flax strongly with the *ribbe-knife*, which consists of a wooden handle and a thin iron blade, with a blunt and somewhat bent edge, and acts admirably in cleaning and parting the filaments, without causing needless waste.

In Belgium, hand-scutching is more generally adopted than scraping. This is done by the *swing-stock* and the *swing-knife* wooden hatchet. The first consists of an upright board, with a groove in its side, into which a handful of flax is so placed that it hangs down over half the surface of the board. While the left hand holds the flax fast above, the right carries the swing-knife, which strikes the flax parallel to the board, with perpendicular blows.

We may, in general, estimate that 100 pounds of the stalks of retted flax, taken in the dry state, afford from 45 to 48 pounds of broken flax, of which, in the swinging or scutching, about 24 pounds of flax, with 9 or 10 pounds of scutch tow are obtained. The rest is boon waste, or shove. To scutch 100 pounds of broken flax clean, 130 hours of labor are required by the hand-scutching method.

Scutching by hand, on the Belgium system, is less

wasteful than scutching by mill. If done by mill, the farmer will do well to select those mills in which improved machinery has been introduced. Scutching machines have been lately invented, which profess to be an improvement on the old scutching stock.

The Courtrai System.

This is a mode of saving flax, which will be found well adapted to our system of agriculture. The flax is pulled in handfuls, and laid flat on the ground, the top ends being laid by the root ends, or tops and roots alternately, which prevents the entangling of the bolls. It should be stooked the day it is pulled, if possible, but the bolls are not to be rippled off. A well-trained stoker will put up the produce of a statute acre, or more, in a day, with two boys or girls to hand him the bunches. The flax should be handed with the tops to the stoker. It is set up in stooks from eight to ten feet long, the top of one handful crossing that of the next, and resting against each other in the form of the letter A. The two ends of the stook are secured by a few stalks brought round from each side, and tied together. The stooks should be drawn to a fine edge on the top, so as to throw off the rain, and thinly put up, that they may get the full benefit of the weather, and preserve an even color.

The flax after having stood in that position for seven or eight days, is sufficiently dry to be tied up in bundles of about 20 inches in circumference, but the seed will not be sufficiently dry to be stacked or put in the barn. It is then ricked and allowed to stay in the field until the seed is dry enough for

stacking. To build the rick, lay two poles parallel on the ground, about a foot asunder, and twelve feet long, with a strong upright pole at each end. The flax is then built on its side, one sheaf in width, laid tops and roots in alternate rows, seven to eight feet high, and finished on the top by laying a single row of sheaves lengthwise, or across the others, then another row as before, with the tops all the same way, which gives a slope to throw off the rain. When dry, it can be stacked or put in a barn.

The trouble of poles can be dispensed with, by putting a row of sheaves, three deep, and of the desired length, on their root ends, then laying the others, as before described, on their sides, in rows, tops and roots alternately, and securing the ends and top with ropes of straw.

In our dry summer climate, the Courtrai rick is not required. The flax can be left to dry in stook, then bound in small bundles, and put in stack or barn, where it will improve by keeping.

Taking off the Seed.

This process is often performed in the winter months. It is done in Belgium with flat beetles. The common flail will answer the same purpose. The sheaves are untied and spread upon the floor in a double row, the top ends coming close together, that they may remain in their even condition; the bolls are then struck till they are broken, the sheaves turned, and the same operation repeated. The flax is then well shaken, to cleanse it from leaves and dust, and tied up in bundles as before.

Steeping,

On the Courtrai System.

This process requires great care and attention. To obtain a white colour, flax must be steeped in running water; river water is the best. On this system flax is either steeped in September or October the year it is grown, or in June the year after. The commonest quality is steeped the same season, and the best quality is kept over for the next year. Two sheaves are tied together with three ties, one sheaf being tied with the top end to the root end of the other, that the bundles may come even for stowage in the crates. The bundles are set erect in the crates, and as close as possible, that the current of the water may not wash away the fibre. The crate, when filled, is flooded in the water or river. It is then covered with boards and sunk with stones two or three inches below the surface. The flax must then be watched, as previously described, under the head of "Steeping."

The crates or frames used in Belgium are about 10 feet long, 8 feet wide, and 3 feet high, and they are made with wooden laths; consequently, this method of steeping can only be practised where the water in the river is about five feet deep.

Taking the flax out of the water has been described on a previous page.

Drying.

After having drained a little, the bundles are removed to the nearest meadow or pasture, separated in handfuls and laid in regular rows. Women follow and set it up in caps, called "Kapellen." After two days the caps are turned inside out, and after two

days more it is fit (if the weather be fine) to be tied in bundles and stacked till the following March, when it is bleached. But, when the quality is not very superior, it is bleached immediately.

This process consists in spreading the flax evenly on the grass, in regular rows, and has been previously described. In dry weather it remains on the grass from twelve to fourteen days. In wet and warm weather it remains for only four or five days, being turned occasionally.

The object of bleaching is to obtain a bright whitish yellow colour. The moment, therefore, a few blue spots make their appearance on the fibre, it is time to lift it from the grass, and set it up in caps to dry. In dry weather it can be taken from the grass and tied up at once, without setting it up in caps. It is now ready for breaking and scutching in the mill, or by hand in the winter months.

Dew Retting.

This is a way of preparing flax for scutching without steeping. It accomplishes the same purpose, by the agency of the air, dews and rain, in a more convenient, though far slower manner. It is particularly recommended for coarse qualities of flax. The flax, after the seed is taken off, is spread out upon meadow or pasture land, but never upon the bare ground or stubble, and turned from time to time, till the stems, on being rubbed between the fingers, show that the harl and the boon are ready to part. The duration of dew-retting is, of course, very various, a moist air being favorable, and dry sunshine the reverse. Mixed retting, however, may be fairly regarded as

the preferable plan, especially for a fine quality of flax, the retting being begun in the water and finished in the air.

Flax Factorship.

This system is extensively practised in Belgium. It is carried on by joint-stock companies, or individuals possessing capital, who either rent land laboured by the farmer and ready for the seed, or, when the plant is in flower, purchase the flax crop on the foot, and at once relieve the farmer of all further responsibilities respecting it, giving him his cash in hand, or approved bills at three months, receiving no further aid from him than such accommodation as may be required, that is, his barns to take off the seed, his horses and waggons to remove the flax, and the use of his meadows and waters. The farmer thus has but to grow the crop to the utmost perfection that good culture, the peculiarities of his soil, seed and seasons will admit of. The flax factor's attention is exclusively devoted to its after-management. The introduction of such a system in Canada would establish among us the fullest amount of improvement that our soil and climate are capable of. The farmer sells the flax-straw to the factor and retains the seed.

This flax factorship realizes, when properly conducted, about 25 per cent. The fabrication of 100 acres of flax, would require about 20 men during the whole year, and 10 boys or girls during the months of July, August, September and October. During these four months the whole body, men and boys, would be employed in pulling, steeping, grassing, &c. Then the men begin the hand scutching, a process

which can only be properly and profitably performed during eight months of the year, as the drought of summer reduces quality and quantity to a considerable extent.

Some may consider scutching by mill or machine more expeditious and less expensive than by hand.

The following figures may be used as comparative, the money being in sterling.

Produce of 100 acres of Flax-straw.

100 acres of flax-straw produces 30			
tons of clean scutched flax, at			
£65 per ton, - - - - -	£1950	0	0
7½ tons of tow, at £15 per ton, - -	112	10	0
110 tons of shoves, at 6s. per ton, -	33	0	0
Total, - - - - -	£2095	10	0

The cost price and expenses of preparation of 100 acres of flax.

100 acres of flax-straw at £8 per			
acre, - - - - -	£800	0	0
Pulling, at 15s. per acre, - - - -	75	0	0
Tying up and stacking, at 12s. per			
acre, - - - - -	60	0	0
Taking off the seed, at 8s. per acre,	40	0	0
Steeping, at 20s. per acre, - - - -	100	0	0
Grassing, at 10s. per acre, - - - -	50	0	0
Turning, at 5s. per acre, - - - - -	25	0	0
Tying up and carting to the scutching			
establishment, at 5s. per acre, - -	75	0	0
Sorting before scutching, at 5s. per			
acre, - - - - -	25	0	0
Scutching 30 tons, at £15 per ton, -	450	0	0
Interest of building (£200), at 5 per			
cent., - - - - -	10	0	0
Total, - - - - -	£1710	0	0
Net profit hand-scutching, - - - - -	£385	10	0

Hand-scutching, notwithstanding its great superiority, cannot always be practised on a very large scale in this country, but may be profitably carried on by individual proprietors.

Retteries, or Steeping Establishments.

In the introduction of the flax crop where it has not hitherto been grown, the establishment of a steeping concern and scutch-mill at once removes all the difficulties arising from the critical nature of the ordinary processes, and the want of a market on the spot for the fibre. With proper instructions in the choice of soils, their preparation, the selection of seed, and the sowing, pulling and saving of the plant, the farmer will be enabled to produce a good article of flax-straw, while the capital, skill and undivided attention of the steeper, will ensure that the fibre is produced in the market in a satisfactory state.

In retteries on Schenck's system, the flax is steeped in wooden vats, with water at a temperature of from 80° to 90° Fahrenheit, heated by steam.

In this country, some may prefer as less expensive, a rettery on a river side, the water from which, at the ordinary temperature, can be run into the vats, and a flow kept on, the flax being grassed after it is taken from the steep, then stacked for scutching in the winter months.

Pressing the flax-straw between rollers, after its removal from the vats, is a great improvement, the fibre showing a marked superiority in quality and cleanness.

[Fuller details respecting Retteries will be found

In the Report on Flax, in the Appendix to the Journals of the Legislative Assembly, Session of 1854-5, H H to M M.]

Systems suitable for Canada.

As a general rule, Canadian farmers sow their flax too thin, thus producing a short branchy stem, with coarse fibre, and abundance of seed. If we wish to compete successfully, with other countries, in the growth of flax, we must produce a fibre that will sell readily in the market. The steady production of such an article, by the grower, will secure a purchaser, where none now exists.

In districts where farmers can sell their flax to a factor, at remunerative prices, in the straw, with or without the seed, there will be no impediment to its extensive cultivation.

But where the grower has to be his own manufacturer, he has a choice of the different methods which have been described, the simplest of which is dew-retting. This can be done, either immediately after rippling off the seed, or he can pull and dry in stook, thrash off the seed at leisure in the barn, and dew-ret in September, or the following June.

This method is only recommended for coarse qualities of flax. Fine qualities should be steeped. This can be done at once after rippling, if the operations of steeping and grassing can be carried on simultaneously with haying and harvest.

Otherwise, pull and save in stook, when dry, cart to stack or barn, thrash off the seed at leisure, and steep and grass in September and October the same year, or in June the year following.

In these cases the flax must be scutched by hand in the winter months, or by a portable horse-power scutching machine of the most approved description, which could be easily taken from one farm to another, to scutch for a reasonable price per cwt., or ton, of clean flax.

Produce of Flax.

Various statements have been made in relation to the average quantity of flax fibre, and of seed, produced per acre. In Belgium, the average weight of fibre, per acre, is much greater than elsewhere. In Ireland, the average is a little under 5 cwts. per statute acre. In England, 5½ cwts. may be taken as the mean produce, and in Belgium it reaches nearly 6 cwts. The yield of seed ranges from 6 to 12 bushels per statute acre. In some districts flax is cultivated principally with a view to a large crop of seed, and, for that purpose is sown thin, on well manured ground. In these cases, the produce reaches, and even exceeds 20 bushels per statute acre, but the weight of fibre is generally small. Neither seed nor fibre, however, should be sacrificed; a good return of both together ought to be the aim of every farmer, as it can be had on land of average quality, by attending to the preceding rules.

The produce in raw flax, or flax-straw, has been ascertained to be from 40 to 45 cwts. per acre of flax-straw, weighed when quite dry, and before seeding.

After seeding, the weight of the straw is reduced by that of the seed and bolls taken off, and by the waste made in the operation. A further loss of weight occurs by retting, &c.

Does Flax exhaust the Soil ?

It was a prevalent opinion at one time that flax was an exceedingly exhausting crop, and for this reason, the farmer, in many old leases in England, was forbidden to grow it. Not only flax, however, but all other plants are exhaustive, if they are removed away from the locality on which they are grown, without being returned in some shape or other to the parent soil. It should be a golden rule to the farmer, to restore to the field the elements withdrawn by his crops, for it is only in proportion as he is successful in accomplishing this result, that he can maintain the uninterrupted fertility of his farm. If flax is exclusively grown for the seed, it is the interest of the grower to allow it to attain the last degree of maturity. It must then be viewed as a seed crop, and as such more exhausting than wheat. But to secure a fine silky fibre, flax should be pulled before the seed ripens, or in a green state. It follows, then, that it should be considered as a green crop, and as such, instead of exhausting, cleanses and fertilizes the soil.

In Belgium a better wheat crop is obtained after flax than after any other crop, and that on soil, of which a well-manured, incoherent sand might be more correctly the title. But, under the ordinary plan of cultivation, farmers were in the right to consider it an exhausting crop, and that its place in rotation should be equivalent to that of a grain crop, which it ought by no means to follow, or be followed by ; whereas, under a system of management which

should allow its constituents to be restored to the manure heap, or to the field, it would be deprived of its permanently exhausting qualities.

If the seed, in its normal state, or after the oil has been extracted from it, be given as food to cattle upon the spot, a very large proportion of the original matter of the soil is returned to it.

It should be borne in mind, that feeding with linseed cake meal is much more profitable than feeding with uncrushed seed, or with crushed seed from which the oil has not been extracted, the cake meal being about three times the more valuable. By its use a better quality of winter butter can be produced. The Flanders farmer, by the use of three pounds of linseed cake meal daily, for his milch cattle, over winter, keeps his butter in that desired soft state required by the London retailer, that is, a state in which it may be sliced off without crumbling, even in the coldest weather.

As flax cultivation extends, the erection of oil-mills in different localities will become necessary, thus securing the crushing of the seed in the locality where it is grown, and furnishing the farmer with a valuable food for his cattle, by means of which he can enrich his soil.

Can Flax be prepared for Spinning without retting ?

This question will be answered by examining the structure of the stem, which consists of the woody heart or boon, and the harl (covered outwardly with a fine cuticle), which encloses the former like a tube,

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consisting of parallel lines. In the natural state the fibres of the harl are attached firmly, not only to the boon, but to each other. When macerated in water, fermentation soon begins, evinced by disengagement of carbonic acid gas, and the production of vinegar. By longer continuance of the steep, the water ceases to be acid, it becomes to a certain degree alkaline, from the production of ammonia, diffuses a fetid odor from the disengagement of sulphureted hydrogen gas, the acetous fermentation being changed into the putrid. Flax, however, must be taken out of the water before the putrid fermentation commences.

It was long hoped that by the employment of breaking machines, dried flax could be freed from its woody particles, while the textile filaments might be sufficiently separated by a subsequent heckling. Experience has, however, proved the contrary. The parting of the fibres in the unretted stalks, is imperfectly effected by the heckling, the flax remains coarser as compared with the retted article, and affords a coarser thread, or if it be made to receive greater attenuation by a long continued heckling, it yields more torn filaments and tow.

Storing of Flax.

Flax, after being scutched, should be stored in a cool dry basement, packed well together, and covered over with bagging.

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